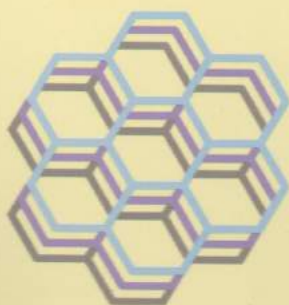


MASSTOR SYSTEMS



FOR YOUR STORAGE SOLUTIONS

MASSTOR SYSTEMS

MASSTOR SYSTEMS

OVERVIEW

Masstor Systems was founded in Santa Clara, California in 1976, to specialize in providing high density mass storage systems for the largest data processing users, together with high speed computer mainframe to mainframe networking products.

MASS STORAGE SYSTEMS

These systems were first introduced into the marketplace during 1982. To date over 300 mass storage systems and 100 high speed networking nodes have been installed. Masstor Systems is continuing to enhance its products and in particular, has already quadrupled the capacity and throughput of its initial storage offering, the M860 Mass Storage System, and has now announced two new products: the M960 Mass Storage System (M960 MSS) and the M1000 Storage Module. These new products represent the highest capacity on-line erasable storage available in the data processing industry.

The need for such mass storage systems has increased in recent years following the extensive growth in both disk and tape within large data centres. The implementation of mass storage enables users to contain the growth of their disk files and hence reap early financial benefits but also gain better control over the bulk of data which currently is off-line, usually poorly managed and highly labor-intensive.

'ALL DATA ON-LINE'

Masstor Systems makes the concept of "All data on-line" a reality. This has been discussed since the early 1970's, but has not been made possible since the technology available from the major manufacturers has failed to keep pace with storage demands. Today major data processing users have invested millions of dollars in magnetic disk technology, yet only a small percentage of their data is stored on-line. The bulk of data is still serviced by labor-intensive magnetic tape technology, which has not significantly changed since the early 1960's.

HELICAL-SCAN TECHNOLOGY

The Masstor Systems' storage products use helical-scan recording technology to record information. This proven technology provides excellent levels of performance, throughput and data accessibility at a storage cost considerably lower than disk. It offers users the ability to store all data on-line. This actually can now be realized since the M1000 Storage Module can store 2 terabytes of data in 0.7 square metres (8 square feet) and attaches, via the M962 Storage Controller, to multiple IBM or compatible CPUs in an MVS environment.

STORAGE MANAGEMENT TASK

The key to obtaining benefit from these high capacity devices is by the use of intelligent software called Storage Management Task (SMT). This resides within the MVS hosts and enables users to access any given part of the data within just a few seconds. It also ensures that the M960 MSS is efficiently managed and ensures a high utilization of the data cartridges.



MASSTOR SYSTEMS

CORPORATE OVERVIEW

NETWORKING

The use of these storage devices can be further extended by Masstor Systems' high speed networking software products, Massnet and Multi-Computer Services (MCS). Massnet is a Network Systems HYPERchannel based 50 MB/sec CPU to CPU network with centralised management. MCS provides a range of application services to run across the network.

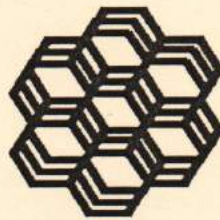
APPLICATIONS

The M960 MSS can be used for a complete range of applications including data management, incremental backup, full volume backup and long-term archiving. In conjunction with Masstor Systems' networking products, reciprocal backup between two or more remote sites becomes a reality. This provides major users with an automated contingency backup and recovery system to secure critical data against loss in the event of a major disaster - an increasing relevant concern of IT management in the era of "multi-center" computing.

SUMMARY

Today, Masstor Systems operates in both North America and Western Europe and has a customer base exceeding 100 of the world's top organizations in banking, insurance, aerospace, manufacturing, telephone, transportation, government, university and research sectors of industry. In Europe Masstor Systems has established local support operations, legal subsidiaries and local management in the UK, France, Germany, Italy, Scandinavia and the Netherlands.

As the demand for on-line storage increases, Masstor Systems will continue to provide cost-effective on-line storage systems, based on helical-scan recording technology, ideal for almost any bulk storage application, to maintain its lead in the mass storage field.



MASSTOR SYSTEMS

USA:

Masstor Systems Corporation, 5200 Great America Parkway, P.O. Box 58017, Santa Clara, CA 95052-8017. Tel: (408) 988 1008 FAX: (408) 737 0676

Masstor Systems Corporation, Chrysler Building, 405 Lexington Avenue, 64th. Floor, New York, NY 10174. Tel: (212) 818 0540 FAX: (212) 818 0943

Los Angeles, California Tel: (714) 660 8944 ● Hartford, Connecticut Tel: (203) 528 9871

Chicago, Illinois Tel: (312) 574 8600 ● Washington, DC Tel: (301) 577 8833

EUROPE:

Masstor Systems International, Shire Hall, Sharnfield, Reading, Berkshire RG2 9XX, United Kingdom Tel: (0734) 871166 FAX: (0734) 869906

Copenhagen, Denmark Tel: (02) 572244 ● Stockholm, Sweden Tel: (08) 755 2780

Paris, France Tel: (01) 47 581201 ● Frankfurt, Germany Tel: (069) 666 6571 ● Rome, Italy Tel: (06) 5920590

Amsterdam, Netherlands Tel: (020) 716441

DATA MANAGEMENT

OVERVIEW

The use of DASD in data processing has increased dramatically over the last few years, with users experiencing typical growth rates of 50% per annum. This growth can be attributed to business demands, leading to the development of new applications requiring on-line access to information.

Growth of this magnitude brings problems associated with the cost of DASD, their floorspace requirements and the effective management of these devices. Management of DASD encompasses such areas as backup and recovery, space allocation and space fragmentation. Interestingly over recent years, these issues have caused a reduction of the effective DASD utilization from approximately 60% to 40%.

TRADITIONAL SOLUTION

In recent years the solution has been to install a DATA MANAGEMENT SYSTEM to automatically manage DASD devices. These Data Management Systems provide:

- the offload of inactive data to other storage devices
- backup data and perform any subsequent recovery
- housekeeping tasks to optimize DASD usage
- management reports

The classic usage of a Data Management System to offload inactive data away from DASD and restore datasets automatically when required by a user. This provides the basis for containing DASD growth. Datasets are selected for this process on criteria such as the number of days since last used. However in a traditional DASD and tape environment this 'number of days' has been kept high to maintain the user's required level of service and to prevent the operations group experiencing high numbers of unscheduled tape mounts. Hence the full potential of the Data Management System is rarely realized. This dilutes the financial benefits that can be achieved.

The problem of utilizing DASD more effectively and placing any 'active data' on-line has been hindered by the lack of a suitable alternative storage system.

SOLUTION WITH MASS STORAGE SYSTEMS

This dilemma can be overcome by substituting labor-intensive tape activity with a cost effective on-line automated storage subsystem such as the M960 MASS STORAGE SYSTEM (M960 MSS). In this environment a much more aggressive selection criteria can be used since there will be no additional operations overhead and the user only experiences typically a 15 second delay in waiting for a dataset to be returned to DASD. This means that DASD can be more effectively utilized and DASD growth can be contained.

The M960 MSS fully supports the following Data Management Systems:

- DFHSM from IBM
- DMS/OS from Sterling Software/Software Laboratories
- ABR from Westinghouse/Innovation Data Processing
- ASM2 from Computer Associates



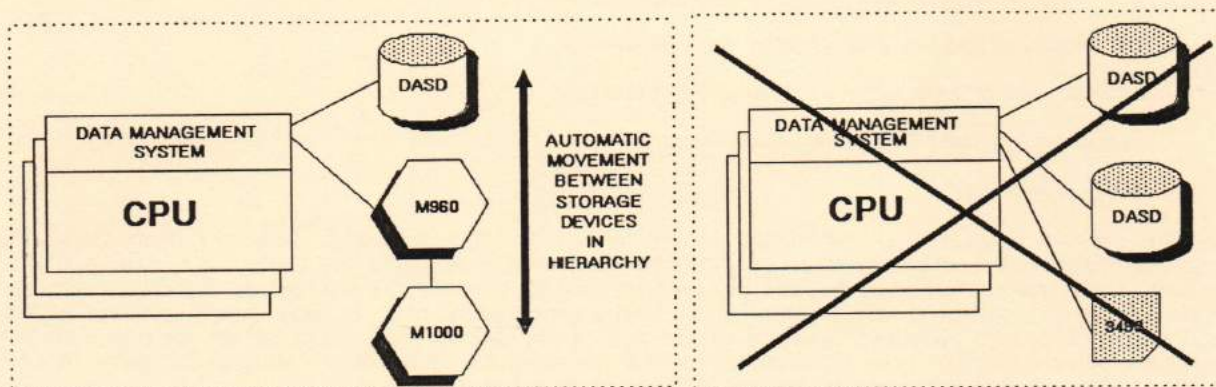
MASSTOR SYSTEMS

APPLICATION BRIEF

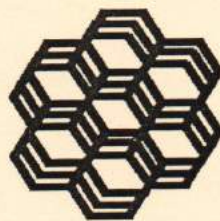
BENEFITS OF THE M960 MSS IN DATA MANAGEMENT

Installation of a Data Management System in conjunction with the M960 MSS provides the following benefits:

- full automation of offload and restore functions
- eliminating operator overheads
- fast restore response for users
- ability to use an aggressive offload policy
- more DASD savings; typically 20% of the total DASD



Find out more about how to effectively control your DASD explosion by contacting:



MASSTOR SYSTEMS

USA:

Masstor Systems Corporation, 5200 Great America Parkway, P.O. Box 58017, Santa Clara, CA 95052-8017. Tel: (408) 988 1008 FAX: (408) 737 0676

Masstor Systems Corporation, Chrysler Building, 405 Lexington Avenue, 64th. Floor, New York, NY 10174. Tel: (212) 818 0540 FAX: (212) 818 0943

Los Angeles, California Tel: (714) 660 8944 ● Hartford, Connecticut Tel: (203) 528 9871
Chicago, Illinois Tel: (312) 574 8600 ● Washington, DC Tel: (301) 577 8833

EUROPE:

Masstor Systems International, Shire Hall, Shinfield, Reading, Berkshire RG2 9XX, United Kingdom Tel: (0734) 871166 FAX: (0734) 869908

Copenhagen, Denmark Tel: (02) 572244 ● Stockholm, Sweden Tel: (08) 755 2780
Paris, France Tel: (01) 47 581201 ● Frankfurt, Germany Tel: (069) 666 6571 ● Rome, Italy Tel: (06) 5920590
Amsterdam, Netherlands Tel: (020) 716441

ARCHIVING

OVERVIEW

As the cost of storage continues to reduce and more organizations require new techniques to serve their customers in a more efficient manner, new computer applications will be developed, replacing current manual activities. Of particular interest are archiving applications, designed to replace manual systems based on paper, COM and microfiche.

APPLICATIONS

The types of applications that can be automated vary by industry sector, but examples include:

- Banks – historical statement archive
- Insurance Companies – policies stored in a digitised form
- Telephone Companies – itemised billing
- Government – large information databases

In addition, forthcoming new application areas such as voice and image processing, will require large quantities of online storage.

DASD AND TAPE

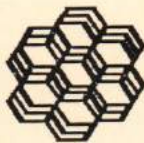
Whilst DASD offers fast access to online information, its cost and the amount of floorspace required, makes its usage prohibitive for very high volumes of archive data. Today, tape is essentially a manual offline medium with a very low capacity per unit of storage, and therefore it also is not ideal for this type of application.

MASS STORAGE

The **M960 MASS STORAGE SYSTEM (M960 MSS)**, provides very high capacity online storage at a low storage cost per megabyte. In particular the **M1000 Storage Module** configured as part of an M960 MSS with the Data Compression option, offers:

- up to 62 Gigabytes per data cartridge
- up to 2 Terabytes of storage per storage module
- average search/rewind time of 18 seconds
- maximum accessor fetch time of 4.3 seconds

This provides the ideal storage system for archiving, offering the correct levels of performance, accessibility, throughput and capacity. In addition the recording techniques used within the M960 MSS allow for direct access to any portion of the data.

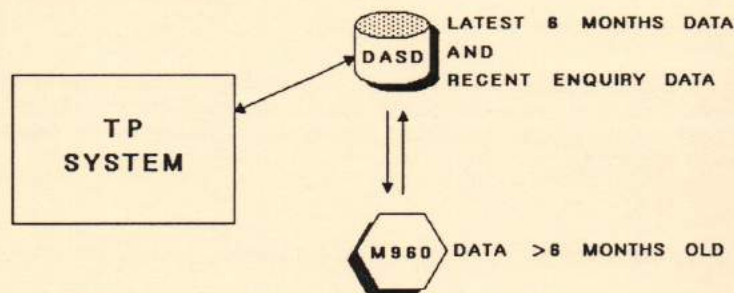


MASSTOR SYSTEMS

APPLICATION BRIEF

EXAMPLE 1. - HISTORICAL STATEMENT ARCHIVE

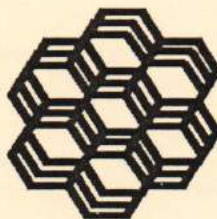
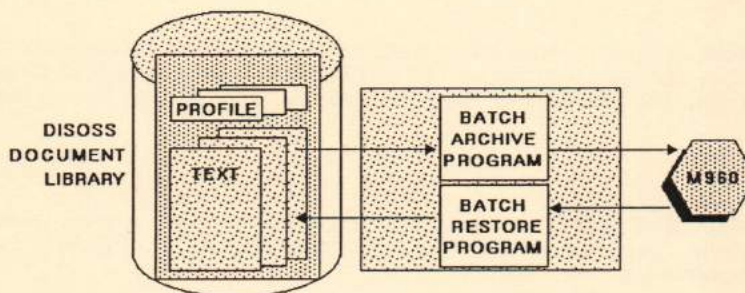
In major banks, an M960 MASS STORAGE SYSTEM can be used for storing historical statement archives. The most recent 6 months of statement data is held on DASD. Every month the oldest month's information is archived to the M960 MSS, where it is kept for 7 years. Enquiries against the M960 resident data are then restored temporarily to DASD for processing.



EXAMPLE 2. - DISOSS

IBM's Distributed Office Support System (DISOSS) provides a method for creating, distributing and storing documents under MVS. Masstor Systems has produced a DISOSS Document Archive and Restore System (DARS) system to allow many large low usage documents to be described in the DISOSS document library, but the document text to be held in an M960 MSS.

DARS provides facilities for selecting the documents to be archived, automatically moving them to the M960 MSS and automatically returning them back to the DASD document library on user request.



MASSTOR SYSTEMS

USA:

Masstor Systems Corporation, 5200 Great America Parkway, P.O. Box 58017, Santa Clara, CA 95052-8017. Tel: (408) 988 1008 FAX: (408) 737 0676

Masstor Systems Corporation, Chrysler Building, 405 Lexington Avenue, 64th. Floor, New York, NY 10174. Tel: (212) 818 0540 FAX: (212) 818 0943

Los Angeles, California Tel: (714) 660 8944 ● Hartford, Connecticut Tel: (203) 528 9871

Chicago, Illinois Tel: (312) 574 8600 ● Washington, DC Tel: (301) 577 8833

EUROPE:

Masstor Systems International, Shire Hall, Shinfield, Reading, Berkshire RG2 9XX, United Kingdom Tel: (0734) 871166 FAX: (0734) 669906

Copenhagen, Denmark Tel: (02) 572244 ● Stockholm, Sweden Tel: (08) 755 2780

Paris, France Tel: (01) 47 581201 ● Frankfurt, Germany Tel: (069) 666 6571 ● Rome, Italy Tel: (06) 5920590

Amsterdam, Netherlands Tel: (020) 716441

AUTOMATED BACKUP

OVERVIEW

DASD devices today are based on non-removeable media, and hence all data residing on DASD has to be physically backed up for security. This backup task used to be a simple exercise that could be accomplished overnight and weekends, once the online systems had been taken down and any batch processing completed. Backup was performed using full volume techniques, copying each DASD volume to tape.

In today's data processing environment, online systems are kept active for longer periods of the day. In parallel the volume of DASD needing to be secured has increased dramatically, whilst tape and DASD technology have not kept pace with these trends. Hence the backup window has been closing at the same time as more data has to be secured.

This has left most major users with a choice – reduce the number of backups taken (which obviously exposes the data to potential loss) or examine alternative techniques for data backup. One alternative is the use of Incremental Backup to secure only datasets that have been changed since the last backup operation.

USE OF TAPE

The traditional backup media is tape, which means the process is essentially manual. Also DASD technology has advanced in capacity much faster than tape, such that today a single DASD volume containing 7.5 Gigabytes of data needs 38 x 3480 tapes to be mounted to secure a single volume.

Tape additionally presents another problem – the reason for performing backups is to allow recovery of data in the event of loss. This restore process is normally required to be completed in the shortest possible time. To restore a complete DASD volume involves the operations group in locating and mounting large quantities of tapes, which is time consuming and prone to error. If incremental backup techniques were used, this task can be considerably worse.

USE OF MASS STORAGE

The backup and restore processes can be made more efficient by using an automatic online storage subsystem such as the M960 MASS STORAGE SYSTEM (M960 MSS). The M960 MSS presents a tape-like interface to MVS, and hence all of the standard backup processes such as full volume, incremental, journalling and image copy work fully in an automated manner.

The M960 MSS can optionally be configured with a hardware data compression feature. This provides an average 50% compression ratio, with typical 60 to 70% compression on database backups. This considerably enhances both the throughput of the backup operation and the capacity of the system with no overheads in either the host CPU's or the M960 MSS. By comparison, software compression techniques are costly in CPU time and may increase the elapsed time for the backup operation. With the data compression option, M960 data cartridges can typically store up to 1 gigabyte of backup data. The new M1000 Storage Module provides typically up to 62 gigabytes in a data cartridge, which allows two complete strings of 3380K units to be backed up to a single cartridge.



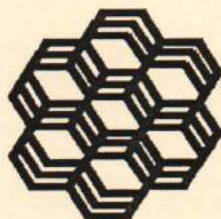
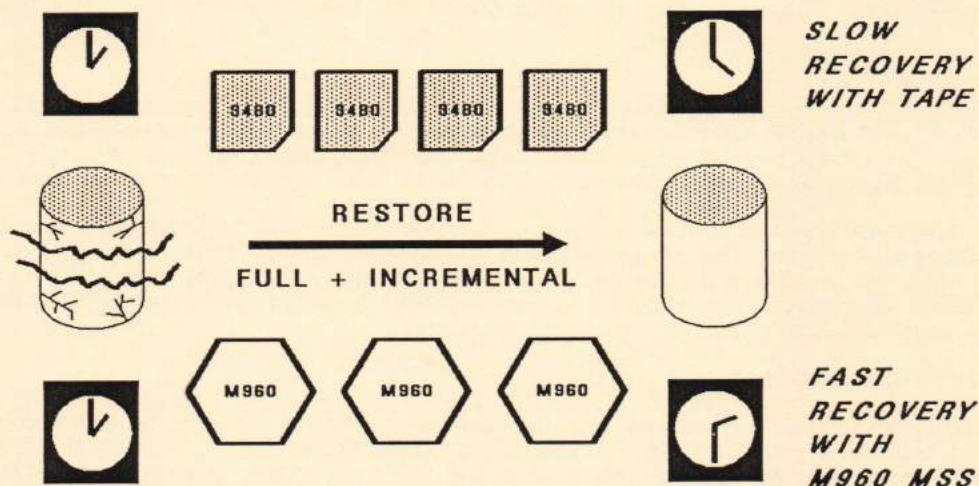
MASSTOR SYSTEMS

APPLICATION BRIEF

BENEFITS

Use of an **M960 MSS** for backup provides:

- Full automation for backup and recovery
- Compatibility with all standard backup products
- Tremendous capacity of storage per unit of media
- All backup data managed under system control
- Ability to take additional application backups during the working day for added security, with no operations overheads.
- Dual copy feature for multiple backup copies with no additional CPU overheads
- Hardware compression feature for enhanced throughput and capacity with no system overheads
- Fast recovery with no manual overheads
- Backup throughput at up to 12 megabytes per second
- Ability to backup your data in a much reduced time window



MASSTOR SYSTEMS

USA:

Masstor Systems Corporation, 5200 Great America Parkway, P.O. Box 58017, Santa Clara, CA 95052-8017. Tel: (408) 988 1008 FAX: (408) 737 0676

Masstor Systems Corporation, Chrysler Building, 405 Lexington Avenue, 84th. Floor, New York, NY 10174. Tel: (212) 818 0540 FAX: (212) 818 0949

Los Angeles, California Tel: (714) 660 8944 ● Hartford, Connecticut Tel: (203) 528 9871

Chicago, Illinois Tel: (312) 574 8600 ● Washington, DC Tel: (301) 577 8833

EUROPE:

Masstor Systems International, Shire Hall, Shinfield, Reading, Berkshire RG2 9XX, United Kingdom Tel: (0734) 871166 FAX: (0734) 869906

Copenhagen, Denmark Tel: (02) 572244 ● Stockholm, Sweden Tel: (08) 755 2780

Paris, France Tel: (01) 47 581201 ● Frankfurt, Germany Tel: (069) 666 6571 ● Rome, Italy Tel: (06) 5920590

Amsterdam, Netherlands Tel: (020) 716441

RECIPROCAL BACKUP

OVERVIEW

The need to re-commence data processing operations, in at least a degraded form, as quickly as possible after a major disaster has become of paramount concern in major organisations. This has led to the formation of companies offering hot or cold standby sites. There are, however, two major problems associated with this type of approach.

1. The elapsed time to get data to the standby site, the difficulty of testing and the likely probability of only a limited system capability, raises the question of whether it will actually suffice in the event of a major disaster.

2. Data has to be secured on tape and sent to an off-site location. Since many hundreds of tapes are produced every day, the logistics of maintaining a 'latest set' and returning them to a working environment in a short period of time is a major, almost impossible, task. Also, once the tapes have been despatched to the off-site location, they are effectively out of management control.

RECIPROCAL BACKUP

The ideal solution for a fully secure automated contingency backup and recovery scheme is to use reciprocal backup between two or more sites. In this scheme, critical data is transferred using high speed networks to a second site, and stored on-line for immediate access in the event of a disaster at the first site. Conversely, the second site can transmit its critical data to the first site, hence the reciprocal capability.

PRODUCTS

Masstor Systems produces a range of complementary hardware and software products for reciprocal backup:

- **M960 MASS STORAGE SYSTEM:** A cost-effective on-line storage system used to hold backup data from both the local and remote sites.

- **MASSNET:** A family of products to provide very high speed processor-to-processor networking either locally or across high speed external PTT lines.

- **MULTI-COMPUTER SERVICES:** A range of applications to move jobs, messages and bulk data between network nodes.

BENEFITS

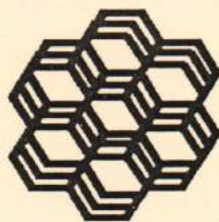
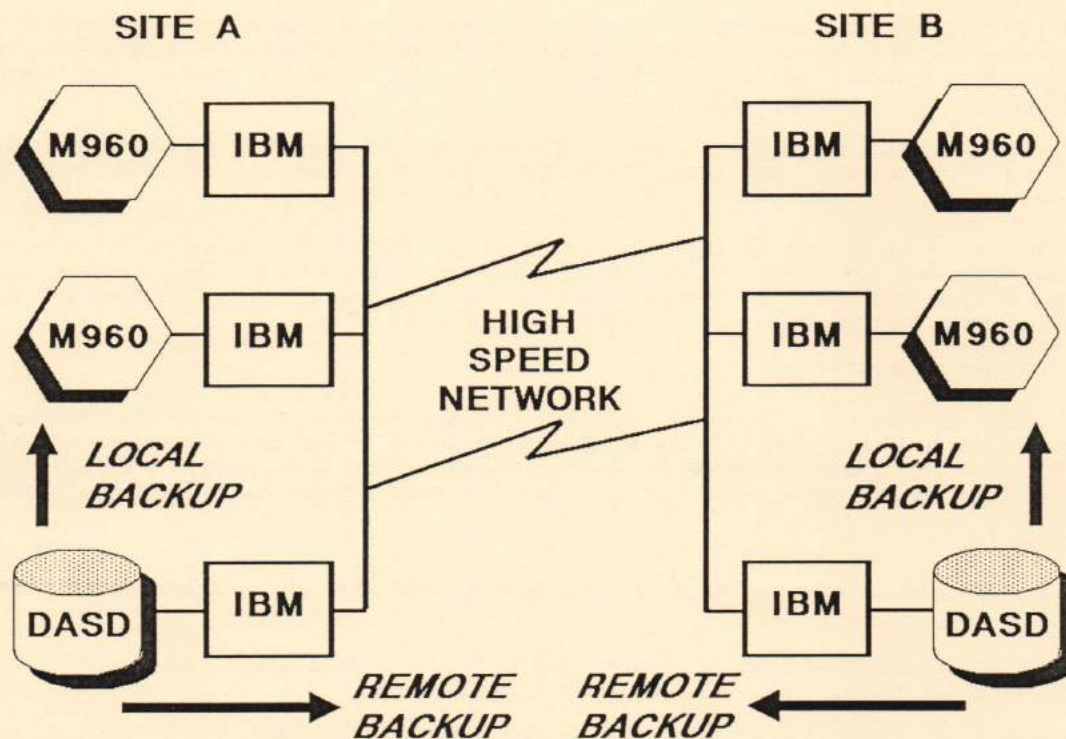
The use these products as the kernel of a contingency backup and recovery scheme provides:

- Unlimited cost-effective storage to hold local and remote backup data
- High speed application level networking
- Inherent testability and auditability
- Automation with management control
- High performance, integrity and reliability



MASSTOR SYSTEMS

APPLICATION BRIEF



MASSTOR SYSTEMS

USA:

Masstor Systems Corporation, 5200 Great America Parkway, P.O. Box 58017, Santa Clara, CA 95052-8017. Tel: (408) 988 1008 FAX: (408) 737 0676

Masstor Systems Corporation, Chrysler Building, 405 Lexington Avenue, 64th. Floor, New York, NY 10174. Tel: (212) 818 0540 FAX: (212) 818 0943

Los Angeles, California Tel: (714) 660 8944 ● Hartford, Connecticut Tel: (203) 528 9871

Chicago, Illinois Tel: (312) 574 8600 ● Washington, DC Tel: (301) 577 8833

EUROPE:

Masstor Systems International, Shire Hall, Shinfield, Reading, Berkshire RG2 9XX, United Kingdom Tel: (0734) 871166 FAX: (0734) 869906

Copenhagen, Denmark Tel: (02) 572244 ● Stockholm, Sweden Tel: (08) 755 2780

Paris, France Tel: (01) 47 581201 ● Frankfurt, Germany Tel: (069) 666 6571 ● Rome, Italy Tel: (06) 5920590

Amsterdam, Netherlands Tel: (020) 716441

SUPPLIERS TO THESE EMINENT ORGANIZATIONS

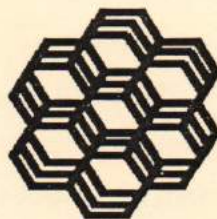
AEROSPATIALE France
BANKENES BETALINGSSENTRAL Norway
BANQUE NATIONALE DE PARIS France
BMW West Germany
BOOTS UK
BP OIL UK
BULL France
BYGGERIETS REAL KREDITFOND Denmark
CAISSE NATIONALE DU CREDIT AGRICOLE France
CENTRAAL BUREAU VOOR STATISTIEK Netherlands
CENTRE NATIONALE D'ETUDES SPATIALES France
COMMISSARIAT A L'ENERGIE ATOMIQUE France
CONOR Sweden
DEUTSCHE BANK West Germany
FELLESDATA Norway
FINMIN West Germany
FRAMATOME France
HAFNIA Denmark
INAIL Italy
LM ERICSSON Sweden
MEDICAL HIGH SCHOOL West Germany
MIDLAND BANK UK
NATIONAL WESTMINSTER BANK UK



MASSTOR SYSTEMS

EUROPEAN CUSTOMER LIST

NCM Netherlands
PHILIPS NORDEN Sweden
PK BANKEN Sweden
POST GIROT Sweden
RATP France
RFV Sweden
ROGALANDSDATA Norway
ROYAL BANK OF SCOTLAND UK
SCIENCE AND ENGINEERING RESEARCH COUNCIL UK
SECURITE SOCIALE France
SNCF France
STATOIL Norway
SVENSKA HANDELSBANKEN Sweden
THOMSON France
TRYGG HANSA Sweden
UNIVERSITY OF LONDON UK
UNIVERSITY OF MANCHESTER UK
VOLKSWAGEN West Germany



MASSTOR SYSTEMS

USA:

Masstor Systems Corporation, 5200 Great America Parkway, P.O. Box 58017, Santa Clara, CA 95052-8017. Tel: (408) 988 1008 FAX: (408) 737 0676

Masstor Systems Corporation, Chrysler Building, 405 Lexington Avenue, 64th. Floor, New York, NY 10174. Tel: (212) 818 0540 FAX: (212) 818 0943

Los Angeles, California Tel: (714) 660 8944 ● Hartford, Connecticut Tel: (203) 528 9871
 Chicago, Illinois Tel: (312) 574 8600 ● Washington, DC Tel: (301) 577 8833

EUROPE:

Masstor Systems International, Shire Hall, Shinfield, Reading, Berkshire RG2 9XX, United Kingdom Tel: (0734) 871166 FAX: (0734) 869906

Copenhagen, Denmark Tel: (02) 572244 ● Stockholm, Sweden Tel: (08) 755 2780
 Paris, France Tel: (01) 47 581201 ● Frankfurt, Germany Tel: (069) 666 6571 ● Rome, Italy Tel: (06) 5920590
 Amsterdam, Netherlands Tel: (020) 716441